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EFFECT OF SMOKING CESSATION ON MULTIPLE SCLEROSIS PROGNOSIS

Cigarette smoking is a risk factor for multiple sclerosis (MS). However, it remains unclear whether smoking cessation alters the course of the disease. This study evaluated the effects of continued smoking, following the diagnosis of MS on the progression to secondary progressive MS (SPMS).

This case controlled, retrospective study utilized data from the Genes and Environment in Multiple Sclerosis (GEMS) study database in Sweden, wherein all subjects completed detailed, yearly questionnaires. All selected subjects had relapsing remitting MS and documented smoking status information. A smoker was defined as someone smoking at least one cigarette per day. Smokers were further classified as continuous smokers, who remained smoking after the diagnosis, quitters, who stopped smoking after diagnosis, or intermittent smokers, with at least one year without smoking after the diagnosis, but without sustained cessation. Smokers were compared to never smokers.

Of the 728 smokers at the time of diagnosis, 332 continued smoking, 118 quit and 278 were intermittent. Of the smokers, 216 converted to SPMS. Accelerated time to progression was noted as 4.7% per year smoking after the MS diagnosis ($p< 0.001$). The median age of conversion to SPMS was 48 years in those who continued smoking and 56 years in those who quit smoking after their diagnosis($p=0.006$).

Conclusion: This study of patients with relapsing multiple sclerosis found that continued tobacco abuse after the diagnosis of multiple sclerosis is associated with accelerated progression to secondary MS.

Ramanujam, R., et al. Effect of Smoking Cessation on Multiple Sclerosis Progression. **JAMA Neurol**. 2015, October 15; 72(10): 1117-1123.

OUTCOME OF UNREPAIRED MENISCUS TEARS AFTER ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION

Anterior cruciate ligament (ACL) tears are frequently accompanied by tears of the meniscus. The management of these associated tears varies from leaving tears *in situ*, to repair and partial meniscectomy. While previous studies have suggested that certain tears of the meniscus left *in situ* can result in positive clinical results, it is thought that clinical outcomes depend upon lesion characteristics. This study reports on the six-year outcomes of meniscal tears, identified during ACL reconstruction, left *in situ*.

This multicenter trial included 194 patients with 208 identified meniscal tears, treated between January of 2002 and December of 2004. Data collected included demographic variables and comorbidities, meniscal tear characteristics and information regarding subsequent surgery. The primary outcome measure was repeat surgery.

Of the 1,399 patients, 914 (65.3%) had concomitant meniscus tears at the time of the index ACL reconstruction. All bucket handle tears were treated. Of the 914, 208 patients (23%) had meniscus tears left *in situ*, with 137 lateral (65.9%) and 71 medial (34.1%). Of these, 97.8% of the lateral and 94.4% of the medial untreated tears required no repeat surgery.

Conclusion: This study of patients undergoing anterior cruciate ligament reconstruction found that meniscal tears identified during the surgery, and left unrepaired, rarely required surgery during the following six-years.

Duchman, K., et al. The Fate of Meniscus Tears Left *in Situ* at the Time of Anterior Cruciate Ligament Reconstruction. A 6-Year, Follow-Up Study From the MOON Cohort. **Am J Sp Med.** 2015, November; 43(10): 2688-2695.

COMBINING STEM CELLS AND ULTRASOUND PROMOTES BONE HEALING

Low intensity pulsed ultrasound (LIPUS) has been found to have up to an 80% cure rate for nonunion, comparable in efficacy to surgery. Recent reports have shown that mesenchymal stem cells also participate in bone tissue repair and regeneration. This study investigated the efficacy of combining stem cells with LIPUS for the healing of bone.

Sprague Dawley rats with surgically created femoral defects were placed in four groups of 10, including sodium alginate plus sham ultrasound (US), LIPUS plus sodium alginate, stem cells plus sham US or LIPUS plus stem cells. Those in the LIPUS group underwent sonication for 10 minutes per day for five consecutive days. Stem cell proliferation was monitored with an MTT assay, with cell proliferation determined with flow cytometry. Bone reparation was evaluated by x-ray.

Cell proliferation in the LIPUS group was higher than that in the controls. At the end of two weeks, the combination group demonstrated homogeneous bone that was similar in density to the normal surrounding bone. After four weeks, bone defects could not be observed by x-ray in all four groups.

Conclusion: This study demonstrates that ultrasound can enhance cell proliferation, with this

process enhanced by the addition of stem cells.

He, R., et al. Combination of Low Intensity Pulsed Ultrasound and C3H10T1/2 Cells Promotes Bone Defect Healing. **Int Orthop**. 2015, November; 39(11): 2181-2189.

HIGH-FREQUENCY SPINAL CORD STIMULATION FOR CHRONIC BACK AND LEG PAIN

Spinal cord stimulation (SCS) is approved for the treatment of chronic, intractable pain of the trunk and limbs. Traditional SCS success has been less than optimal. As previous work has suggested an advantage of higher frequency stimulation (HFS), this study compared the effects of HFS at 10kHZ to those of traditional low-frequency (LFS) at 5kHZ for the treatment of chronic back pain.

Subjects were 171 patients with chronic intractable pain of the trunk and/or limbs who qualified to receive implanted SCS systems. These patients were randomized to two groups, one receiving HFS and one receiving LFS. Outcome measures included a visual analogue scale for pain (VAS), the Oswestry Disability index, the Global Assessment of Functioning, subject satisfaction, adverse events, and a standard neurologic assessment. Evaluations were performed at baseline and at three, six, nine and 12 months after the follow-up.

At three months, among permanently implanted subjects, 84.5% were back pain responders (≥50% reduction in VAS score) with HFS therapy, as compared with 43.8% with traditional LFS treatment ($p<0.001$) The relative ratio for responders to high versus low frequency stimulation was 1.9 for back and 1.5 leg pain. The advantage of HFS over LFS for both leg and back pain was sustained at 12 months. One third of the subjects in the HFS group reduced or eliminated their opioid analgesic intake despite an average of 13 years of chronic pain.

Conclusion: This study of patients with chronic back and leg pain found that spinal cord stimulation at 10 kHz frequency is superior to traditional spinal cord stimulation for treating leg and back pain.

Kapural, L., et al. Novel 10 Khz High-Frequency Therapy (HF 10 Therapy) is Superior to Traditional Low-Frequency Spinal Cord Stimulation for the Treatment of Chronic Back and Leg Pain. **Anesthesiology**. 2015, October; 123 (4): 851-860.

TRANSCRANIAL MAGNETIC STIMULATION AND CERVICAL DYSTONIA

Studies have suggested that people with cervical dystonia (CD) may have impaired sensorimotor integration and plasticity, with overactivity of the primary motor cortex (M1) with reduced intracortical inhibition. This study examined whether the use of repetitive transcranial magnetic stimulation (rTMS) to inhibit the sensorimotor cortex can normalize evoked potential amplitudes and short latency afferent inhibition (SAI) in patients with CD.

Twelve patients with CD underwent one session of rTMS over the left primary sensory cortex as an active condition and a separate session at the left primary motor cortex, as a control condition. Eight, healthy, control patients underwent one session of rTMS over the left primary sensory cortex only. Motor evoked potential (MEP) amplitudes and short latency afferent inhibition (SAI) were measured before and after rTMS at the right first dorsal interosseous muscle and the right index finger, respectively.

At baseline, MEP amplitudes did not differ between the groups. However, the SAI was relatively decreased in subjects with CD. After the inhibitory rTMS to the primary sensory cortex, MEP amplitudes increased. This was not true with stimulation to the primary motor cortex. In contrast, SAI normalized after rTMS to both the primary sensory and motor cortices.

Conclusion: This study of patients with cervical dystonia found that their impaired sensorimotor integration could be normalized by inhibitory stimulation to the primary sensory and motor cortices using rTMS.

Zittel, S., et al Normalization of Sensorimotor Integration by Repetitive Transcranial Magnetic Stimulation in Cervical Dystonia. **J**

Neur. 2015, August; 262 (8): 1883-1889.

BRAIN MODULATION FOR CHRONIC TEMPOROMANDIBULAR DISORDERS

Temporomandibular disorders (TMD) often result in pain and masticatory dysfunction, despite a range of treatments. As several studies have shown that stimulation of the primary motor cortex can provide analgesia in patients with refractory central pain, this study assessed the effect of high definition transcranial direct current stimulation (tDCS) in patients with pain-related TMD.

Subjects were 24 female adults with chronic myofascial TMD pain, all with daily, chronic pain and dysfunction for at least one year. Pain was measured with a Visual Analogue Scale (VAS), the Short Form of the McGill Pain Questionnaire and Pain Trek, as well as pain-free mouth opening. All subjects underwent 20-minute sessions of active or sham 2 mA HD-tDCS at the M1 stimulation area, five times per day. The primary outcome measure was a pain VAS decrease of 50% or greater from week one to week six.

At week six, nine of 13 in the active group and three of 11 in the sham group achieved a greater than 50% decrease in VAS pain (p=0.04). There was a significant difference in the change in pain free opening of the mouth from week one to week three (p<0.01), but not at week six (p=0.24).

Conclusion: This study of female patients with chronic temporomandibular disorders found that high definition transcranial direct current stimulation can produce meaningful, long-term pain relief.

Donnell, A., et al. High Definition and Noninvasive Brain Modulation of Pain and Motor Dysfunction in Chronic TMD. **Brain Stim**. 2015, November-December; 8(6): 1085-1092.

NINTENDO WII – BASED THERAPY FOR POSTSTROKE REHABILITATION

After stroke, the recovery of hand function is a factor significantly associated with independence in everyday life. Among treatments for upper extremity rehabilitation, constraint induced movement therapy (CIMT) is among the current best practices. This study compared a commercial videogame, the Nintendo Wii, to CIMT for the treatment of upper extremity function after stroke.

Subjects were 42 patients with upper extremity limb impairment, three to 12 months post-stroke. The patients were randomized to receive either CIMT or Wii, in a 14-day, dose-matched, assessor-blinded trial. Those in the modified CIMT group agreed to wear the constraint mitt on the less affected hand for up to 90% of waking hours. Therapy included shaping practice, tailored to the patient's motor function. For the Wii group, the controller was used only in the more affected hand to engage in games of golf, boxing, baseball, bowling and tennis. The primary outcome measures were the Wolf Motor Function Test timed-tasks (WMFT-tt) and the Motor Activity Log Quality of Movement scale (MALQOM).

Linear mixed model analyses revealed a change in MALQOM score (p<0·001) across all time points and a nonsignificant trend for the WMFT-tt (p=0.052), with improvements persisting at six months. No significant differences were found between the groups on either primary outcome measure. Patients reported high perceived improvement in satisfaction scores, with no difference between groups.

Conclusion: This study demonstrates that Wii may be as effective as Constraint Induced Movement Therapy for improving motor function of upper extremities after stroke.

McNulty, P., et al. Efficacy of Wii-Based Movement Therapy for Upper Limb Rehabilitation in the Chronic Post Stroke?: A Randomized, Controlled Trial. **Intern J Stroke**. 2015, December; 10(8): 1253-1260.

URGENT MANAGEMENT OF TRANSIENT ISCHEMIC ATTACK

Previous research has demonstrated that, following a transient ischemic attack (TIA), untreated patients have an increased risk of stroke, with recurrence rates by 90 days of up to 17%. Studies have also demonstrated that urgent intervention after TIA is associated with a significant reduction in the short-term risk of stroke. This study evaluated the three-year outcomes of patients treated with a predefined clinical pathway of urgent care after TIA.

Subjects included consecutive patients with TIA, diagnosed by vascular neurologists. The expedited protocol was implemented within 24 hours, with measures including ; antiplatelet therapy (aspirin 100 mg per day) initiated immediately, except in patients with a cardioembolic origin where anticoagulants were the first choice; antihypertensive therapy to obtain a target level of less than 140/80, and 135/85 in nondiabetic and diabetic patients respectively; statins prescribed to achieve a low density lipoprotein target of 100mg/dl or less in moderate, and 70 mg/dl or less in high vascular risk profile patients.

Subjects were 686 patients, of whom 63% had confirmed TIA. Stroke occurred in 90 days in nine patients, seven within 24 hours. The risk of stroke was 2.6%, 3.7% and 4.4%, at 12, 24 and 36 months, respectively. The composite outcomes of stroke, myocardial infarction or vascular death were 3.5% 4.9% and 5.6% at 12, 24 and 36 months, respectively.

Conclusion: This study of patients with transient ischemic attacks found that a rapid care model of urgent intervention can reduce the risk of subsequent stroke.

Guarino. M., et al. Short- and Long-Term Stroke Risk after Urgent Management of Transient Ischemic Attack: The Bologna TIA Clinical Pathway. **Euro Neurol.** 2015; 74(1-2): 1-7.

PERIPHERAL TAU CONCENTRATION WITH TRAUMATIC BRAIN INJURY

Traumatic brain injury (TBI) is recognized as the signature injury of combatants in recent Middle Eastern deployments. Current diagnostic tools are unable to identify individuals at greatest risk for chronic neurologic deficits following TBI. As tau is a protein associated with axonal injury, this study examined the associations between tau concentrations and the

severity, number and frequency of deployment related TBIs.

Subjects for this study were United States military personnel deployed within the prior 16 months. Plasma tau concentrations were measured using a novel ultrasensitive assay. Subjects were classified as positive or negative for a self-reported TBI, endorsing either loss of consciousness or experiencing symptoms of posttraumatic amnesia. The diagnosis of or treatment for TBI was extracted from medical records. Tau concentrations were compared between those with and those without a history of TBI.

Of the subjects, 70 were in the TBI group and 20 in the control group. A significantly elevated concentration of total tau was found in the self-reported TBI group as compared to the controls (p=0. 003). Within the self-reported TBI group, severity variables were significantly related to total tau concentrations. In addition, total tau concentrations were associated with a medical record of TBI compared to those with only a self-reported TBI, as well as for those reporting the occurrence of three or more TBIs as compared with fewer (p= 0.008). The severity of total post-concussive symptoms correlated with total tau concentrations in the self-report group (p=0.003).

Conclusion: This study of military personnel with a history of traumatic brain injury (TBI) found that total tau concentrations in the peripheral blood correlated with the severity and frequency of TBIs.

Olivera, A., et al. Peripheral Total Tau in Military Personnel Who Sustain Traumatic Brain Injuries during Deployment. **JAMA Neurol**. 2015, October; 72(10): 1109-1116.

AORTIC REGURGITATION AND ANKYLOSING SPONDYLITIS

Cardiovascular disease is known to be more common among those with rheumatoid arthritis and psoriatic arthritis than among the general population. This study assessed the prevalence of aortic regurgitation (AR) among patients with ankylosing spondylitis (AS).

Patients diagnosed with AS underwent electrocardiography and subsequent transthoracic echocardiography. Disease activity in all subjects was measured with the Ankylosing Spondylitis Disease Activity Score and the Bath Ankylosing Spondylitis Disease Activity Index. The average erythrocyte sedimentation rate during the previous five years was also calculated. The presence of HLA-B27 antigen and its alleles was also assessed.

Subjects were 187 patients with an average age of 50.4 years and an average duration of AS of 24 years. Aortic regurgitation was found in 34 patients (18%), with only three of these having previously been diagnosed. Conduction abnormalities were documented in 25 (13%) of patients, and were more common among those with AR(p=0.005). Aortic regurgitation was independently associated with disease duration and increased age, while HLAB27 was present in similar proportions among those with and those without AR.

Conclusion: This study of patients with ankylosing spondylitis found that aortic regurgitation or cardiac conduction abnormalities are common among these patients. The authors suggest that cardiac workup be part of their routine management.

Klingberg, E., et al. Aortic Regurgitation Is Common in Ankylosing Spondylitis: Time for Routine Echocardiography Evaluation? **Am J Med**. 2015, November; 128(11): 1244-1250.

INJECTION VERSUS IMPLANTATION OF STEM CELLS FOR KNEE OSTEOARTHRITIS

Osteoarthritis (OA) results from the failure of chondrocytes to repair damaged articular cartilage in synovial joints. As mesenchymal stem cells (MSC) have been suggested as a potential therapy for the treatment of OA, this study compared the outcomes of patients treated with arthroscopic MSC injection to those with MSC implantation.

Subjects were patients with full thickness articular cartilage lesions with symptoms of knee joint pain and/ or functional limitations despite three months of nonsurgical treatment. Of the participants, the first 71 were treated with autologous MSC injection, and the next 94 underwent autologous MSC implantation with a fibrin glue scaffold. Among these, 52 patients in the injection group and 63 in the implantation group agreed to follow-up arthroscopic evaluation. For all patients, stem cells were harvested from adipose tissue, with a mean of 4.01×10^6 stem cells prepared. Outcome evaluations included International Knee Documentation Committee Scores (IKDC) and the Tegner activity scales to assess joint function and sports activity.

At the time of second look arthroscopy, at a minimum of 12.6 months postoperatively, significantly better improvement was noted in the implantation group for both the IKDC and the Tegner activity scores ($p<0.001$ for all comparisons). At the final follow-up, at 28.6 months postoperatively, further improvement was noted in the implanted group, with no such improvement seen in the injection group.

Conclusion: This study of patients with osteoarthritis of the knee found that mesenchymal stem cells can produce significant improvement, especially when implanted during arthroscopic surgery.

Kim, Y., et al. Comparative Matched-Analysis of the Injection versus Implantation of Mesenchymal Stem Cells for Knee Osteoarthritis. **Am J Sport Med**. 2015, September; 42 (11): 2738-2746.

KINESIO TAPE AND POSTURAL CONTROL IN STROKE

Postural instability among patients with stroke is thought to impact activities of daily living, independent living and gait. As previous studies have demonstrated that kinesio tape (KT) can improve postural control and gait, this study was designed to determine the short-term effects of KT on ankle stability in patients with stroke.

Subjects were 40 patients with chronic stroke, between the ages of 30 and 60 years. The participants scored 21 to 56 on the Berg Balance Scale (BBS), and spasticity levels of two to three on the modified Ashworth Scale. All were able to stand for at least 30 seconds, change walking direction and understand instructions. For all patients, KT was applied to the

affected ankle in the direction of dorsiflexion and eversion to correct the equinovarus deformity. Postural control was evaluated by functional tests and force plate measurements before and after the application of the tape.

At 24 hours, significant differences were seen between groups in the functional reach test (p=0.04), and mediolateral center of pressure and displacement (p=0.04). Immediately after KT, the BBS scores improved significantly in the KT group (p=0.02), with no other immediate improvements noted.

Conclusion: This study of patients with chronic stroke found that kinesio tape can improve elements of postural control, with these effects most apparent at 24 hours after taping.

Rojhani-Shirazi, Z., et al. Effects of Ankle Kinesio Taping on Postural Control in Stroke Patients. **J Stroke Cerebrovasc Dis.** 2015, November; 24(11): 2565-2571.

INFRAPATELLAR FAT PAD VOLUME AND KNEE STRUCTURE CHANGES IN OSTEOARTHRITIS

Osteoarthritis (OA) is the most common form of arthritis, with well-known risk factors including age, gender and body mass index. As the Infrapatellar fat pad (IPFP) is located close to cartilage and bone surfaces, it is hypothesized that this structure may serve to reduce loading on the joint, thus limiting the progression of knee OA. This study assessed the association between the volume of the IPFP and structural measures among patients with OA of the knee.

Subjects included 174 patients diagnosed with knee OA, with a mean age of 55.5 years. The subjects were assessed by anthropometric and radiographic evaluations, with T1-weighted MRI used to evaluate knee cartilage. Comparisons were made between structural changes of the cartilage and the IPFP.

After adjusting for potential confounders, a greater IPFP volume was found to be associated with greater tibial and patellar cartilage volume, and fewer cartilage defects, at all sites measured. The IPFP was not significantly associated with joint space narrowing.

Conclusion: This study of patients clinically diagnosed with osteoarthritis of the knee found that a greater infrapatellar fat pad volume was associated with fewer structural abnormalities, suggesting a protective role.

Cai, J., et al. Association between Infrapatellar Fat Pad Volume and Knee Structural Changes in Patients with Knee Osteoarthritis. **J Rheum.** 2015, October; 42 (10): 1878-1884.

HUMAN GROWTH FACTOR TO MAINTAIN CARTILAGE HEALTH

The lifetime risk of symptomatic knee osteoarthritis (OA) is 45%. To date no disease modifying OA drug (DMOAD) has been shown to modify structural pathologic progression in the synovial tissue. Most studies of DMOADs have evaluated structural progression as a reduction in radiographic joint space width. This study evaluated the effect of recombinant human growth factor 18 (Spriferman) on cartilage loss.

This multicenter, randomized, double-blind, placebo-controlled trial included patients with radiographic evidence of OA of the knee. The initial study evaluated 168 patients using Spriferman intraarticular injections at 10, 30 and 100 µg or placebo. Medications were received once per week for three weeks and again administered three months later, given over three weeks. Magnetic resonance imaging was completed at baseline and at three, six and 12 months after treatment, with comparisons made between subjects at sub-regions of the joint that displayed cartilage loss and at those that displayed cartilage gain.

One year from baseline, the difference in cartilage thickness loss in sub-regions experiencing loss was significantly less in those treated with 100 µg Spriferman, compared to placebo (p= 0.03). In the sub-regions demonstrating gain, those treated with 100 µg Spriferman displayed greater cartilage thickening than did those treated with placebo (p= 0.028).

Conclusion: This study of patients with knee osteoarthritis suggests that, when compared with placebo, treatment with recombinant human growth factor 18, Sprifermin, results in added cartilage in some locations and reduced cartilage loss in others.

Eckstein, F., et al. Intra-Articular Spriferman Not Only Increases Cartilage Thickness, but Also Reduces Cartilage Loss: Location-Independent Post-Hoc Analysis Using Magnetic Resonance Imaging. **Arthritis Rheum**.2015, November;67 (11):2916-2922.

PROGESTERONE VERSUS CORTICOSTEROIDS FOR CARPAL TUNNEL SYNDROME

Carpal tunnel syndrome (CTS) is the most common entrapment neuropathy of the upper limb. Among conservative, nonsurgical treatments, local corticosteroid injections have been found to provide symptomatic relief for many patients. As progesterone has been found to have neuroprotective effects, this study compared the effects of local steroid injections with those of local progesterone injections for patients with CTS.

This prospective study included 60 hands of patients with bilateral mild or moderate, idiopathic CTS. Subjects in the corticosteroid group received a single injection of 0.5 mL triamcinolone acetate, 40 mg per mL, and 0.5% of two percent lidocaine. Those in a progesterone group received a single local injection of 0.5 mL 17-alpha hydroxy progesterone (500 mg/2 mL) and 0.5 mL lidocaine (2%). The groups were compared for symptom severity, functional status and electrodiagnostic test results before and 10 weeks after treatment. Pain was assessed on a visual analogue scale. Symptoms and function were assessed using the Bostone/Levine symptom severity and functional status scales. Electrodiagnostic studies were completed before and after treatment.

Pain severity decreased significantly in both groups (p=0.00001 for both), with no significant difference between the two groups. Median distal sensory latency improved in the corticosteroid as well as the progesterone group (p=0.0002) and p=0.009 respectively) as did the motor onset latencies (p=0.003 and p=0.014 respectively). There was no meaningful difference in these measures between the two groups. Patient satisfaction with the

injections was greater in the corticosteroid group 10 weeks after injection than in the progesterone group (p=0.005).

Conclusion: This study of patients with carpal tunnel syndrome found that both progesterone and corticosteroids produce significant improvement in patient symptoms, with no significant difference found between the two interventions.

Bahrami, M., et al. Comparison between the Effects of Progesterone versus Corticosteroid Local Injections in Mild and Moderate Carpal Tunnel Syndrome: A Randomized, Clinical Trial. **BMC Musculoskel Dis.** 2015. 16: 322.

OXYCODONE PLUS NALOXONE FOR CHRONIC PAIN IN PARKINSON'S DISEASE

Pain is a fundamental symptom of Parkinson's disease (PD) that is often unrecognized and undertreated. This study was designed to evaluate the safety and efficacy of using opioids in patients with PD.

This eight week, single center, prospective, observational trial included 14 patients with PD and chronic pain syndromes. The participants were prescribed oxycodone hydrochloride, combined with naloxone hydrochloride dehydrate (OXN PR 5/325), beginning at once a day and titrated to twice per day after one week. Pain intensity was assessed by the 11-point Numeric Rating Scale (NRS) and the Brief Pain Inventory (BPI), motor status by the Unified Parkinson's Disease Rating Scale Section-III (UPDRS-III) and cognitive status by the Mini Mental State Examination (MMSE). In addition, the patients were assessed with the Global Impression of Change (CGI-C). All were followed with weekly examinations for eight weeks.

A significant reduction was seen in the NRS scores during the entire observation (ANOVA $p<0.05$). A 30% or greater reduction in the mean NRS scores was noted from baseline to eight weeks in 56% of the patients. The ratings were much improved for 42.86% of the patients. Bowel function was not worsened by the analgesic treatment, as demonstrated by changes in BFI scores.

Conclusion: This study of patients with Parkinson's disease found that a combination of oxycodone XR and naloxone may be a safe and effective treatment for chronic pain.

Madeo, G., et al. Efficacy and Safety Profile of Prolonged Release Oxycodone in Combination with Naloxone (OXN PR) in Parkinson's Disease Patients with Chronic Pain. **J Neur**. 2015, September; 262(9): 2164 -2170.

HIP AND KNEE STRENGTHENING EXERCISES FOR KNEE PAIN

For patients with knee osteoarthritis (OA), there is consistent evidence that exercise therapy is beneficial for improving pain, function and quality of life. However, the most effective exercise prescription for these patients has yet to be established. This study compared the isolated effects of hip strengthening to leg strengthening exercise for patients with knee OA.

This single-blinded study included patients with knee OA and a pain subscale score of 68 or less on the knee injury and osteoarthritis score (KOOS). Patients were randomly assigned to 12 weeks of either isolated hip or isolated leg strength and flexibility exercises, completed three to five days per week. Outcome measures included the KOOS, and the Western Ontario and McMaster Arthritis Index (WOMAC) questionnaire, the six-minute walk test, range of motion and muscle strength.

Of the 71 patients completing the study, both groups demonstrated significant improvement on the KOOS and the WOMAC pain subscale scores. No clinically or statistically significant differences were found between the two groups on the KOOS scores with a statistically significant difference in the WOMAC scores. No significant changes in the six-minute walk test or range of motion were noted in either group.

Conclusion: This study of patients with osteoarthritis of the knee found that knee and leg strengthening exercises provided equal improvement in pain and knee function.

Lun, V., et al. Efficacy of Hip Strengthening Exercises Compared with Like Strengthening Exercises on Knee Pain, Function Quality-Of-Life in Patients with Knee Osteoarthritis. **Clin J Sports Med.** 2015, November; 25 (6): 509-517.

FASCIA CRURIS TEAR AT THE ATTACHMENT OF THE ACHILLES TENDON

Injury to the fascia cruris at the attachment to the Achilles is not often considered to be a cause of achillodynia. This paper describes a case series of athletes with pain in the Achilles region and tears of the fascia cruris.

This retrospective review describes a series of nine patients presenting with pain in the Achilles, all seen in a single sports injury clinic between 2008 and 2012. All subjects were identified by ultrasound as having tears in the fascia cruris at the attachment to the Achilles tendon.

The patients presented at a mean of 4.5 weeks after symptom onset. The patients typically reported a sensation of calf tightness over the preceding days or weeks, and then a rapid onset of pain in the Achilles region during activity. The pain and tenderness were localized over the medial or lateral border of the Achilles and were associated with swelling. Clinically, mild swelling was seen over the mid-upper portion of the Achilles tendon, which was tender to the touch. Diagnostic ultrasound identified findings compatible with a tear of the fascia cruris at the attachment to Achilles tendon. Treatment involved a combination of conservative measures, resulting in a return to full activities at an average of 5.2 weeks.

Conclusion: This case series describes patients with a tear to the fascia cruris at its attachment to the Achilles tendon, thought to be related to the patients' Achillodynia.

Webborn, N., et al. Acute Tear of the Fascia Cruris at the Attachment to the Achilles Tendon: A New Diagnosis. **Br J Sport Med.** 2015, November; 49 (11):1398-1403.

HORMONE REPLACEMENT THERAPY AND ARTHROPLASTY SURVIVAL

As there is no known cure for osteoarthritis (OA), total joint arthroplasty remains the most effective treatment for severe knee

and hip OA. The main causes for failure in the first year after surgery are osteolysis and aseptic loosening, accounting for 75% and 40% of revision surgeries after total hip arthroplasty and total knee arthroplasty, respectively. As hormone replacement therapy (HRT) has anti-resorptive effects, this study reviewed the effects of this treatment on implant survival following knee or hip arthroplasty

This population based, retrospective cohort study included patients with data recorded in the General Practice Research Database of the United Kingdom, who were seen between 1986 and 2006 for total hip arthroplasty or total knee arthroplasty. Women with at least six months of HRT were identified as users. A total of 2,700 HRT users were compared with 8,100 nonusers, with data followed for a median of 3.3 years after surgery to assess the survival of the implants.

The overall cumulative revision rates at three years were 0.97% for total hip arthroplasty and 0.76% for total knee arthroplasty. HRT use for least six months was associated with a reduction in risk of failure, with a corresponding hazard ratio of 0.62 (p=0.023). The use of HRT for a year or more was related to a further reduction in failure risk, with a hazard ratio of 0.48 (p=0.003).

Conclusion: This study of patients undergoing total hip or total knee arthroplasty for osteoarthritis of the joint found that hormone replacement therapy for at least six months was related to a significant increase in implant survival.

Prieto-Alhambra, D., et al. Hormone Replacement Therapy and Mid-Term Implant Survival following Knee or Hip Arthroplasty for Osteoarthritis: A Population Based Cohort Study. **Annals of Rheumatic Dis**. 2015; 74 (3):557-563.

EPIDURAL INJECTION OF AUTOLOGOUS SERUM

Cervical radiculopathy is a common complaint of middle to older patients at orthopedic outpatient clinics. As research has suggested that biochemical sensitizers make nerve roots susceptible to mechanical effects of a herniated mass, interleukin one and prostaglandins are commonly seen as involved in producing radiculopathy. Autologous conditioned serum (ACS) is derived by processing the patient's blood to produce high concentrations of interleukin I receptor antagonists. This study evaluated the efficacy of ACS in patients with cervical radiculopathy who had failed conservative treatments.

Forty patients with neck pain radiating into one upper limb for at least six weeks were randomized to receive either ACS or methylprednisolone (MPS). The subjects were assessed with a visual analogue scale (VAS) for pain, the Neck Pain Disability Scale (NPDS) and the Neck Disability Index (NDI). Measurements were made at baseline, and then at three weeks, three months and six months after injection.

The mean, six-month improvement in VAS scores for patients receiving ACS was 73.2%, while that for those receiving MPS was 58.4%. Over the same timeframe, the mean NPDS score decreased in the ACS group by 73.76% and in the MPS group by 55.6%. The mean NDI scores decreased by 74.47% in the ACS group and by 52.8% in the MPS group.

Conclusion: This study of patients with cervical radiculopathy found that epidural injections of autologous condition serum are at least as effective as steroid injections for reduction of pain and disability.

Goni, J., et al. Efficacy of Epidural Perineural Injection of Autologous Condition Serum in the Unilateral Cervical Radiculopathy. **Spine.** 2015, August; 40(16): E915-E921.

CORRECTIVE SURGERY FOR TRAUMATIC VERTEBRAL ARTERY OCCLUSION

Traumatic occlusion of the vertebral artery occurs in up to 19.7% of patients with cervical spine injury. While ischemic stroke has been associated with this injury, data are lacking regarding the risk of ischemic stroke in the setting of traumatic vertebral artery (VA) occlusion with an operative spine injury. This study analyzed risk factors associated with ischemic stroke in patients with blunt traumatic VA occlusion.

This retrospective study included 52 patients with VA occlusion due to high energy blunt trauma. All injuries were assessed with thin-slice CT, with or without MRI. Management of the cervical spine injury was determined by the spine surgery staff. All subjects were treated with daily aspirin at 325 mg per day unless contraindicated.

Of the 52 patients, 10 suffered an ischemic stroke attributable to the VA occlusion, with seven of the strokes symptomatic and two resulting in death. Those who sustained strokes were significantly older (p=0.042) and had a lower rate of spine surgery (10% with stroke, and 61% without stroke, p<0.05). Multivariate logistic regression demonstrated fewer ischemic strokes in patients treated with spine surgery (p=0.014). Increasing age and bilateral VA injury were associated with increased risk of ischemic stroke (p=0.065 and p=0.084, respectively).

Conclusion: This study of patients with traumatic vertebral artery occlusion found a high risk of ischemic stroke, with an increased risk among patients with advanced age and a decreased risk among those undergoing cervical spine surgery.

Foreman, P., et al. Corrective Spinal Surgery May Be Protective against Stroke in Patients with Blunt Traumatic Vertebral Artery Occlusion. **J Neurosurg Spine**. 2015, November; 23: 665-670.

BEHAVIOR PROBLEMS IN CHILDREN WITH MILD TRAUMATIC BRAIN INJURY

Mild traumatic brain injury (mTBI) accounts for the vast majority of emergency room visits among children with traumatic brain injury. This study was designed to further clarify the behavior sequela of mTBI in children during the first year after injury.

Children between the ages of eight and 15 were recruited from consecutive outpatient emergency department visits of two children's hospitals between 2001 and 2006. Those diagnosed with mTBI were compared with the control group who sustained upper or lower extremity fractures. Children were assessed at baseline and then at follow-up at three and 12 months post injury. Evaluations included parent completed the Child Behavior

(Continued from page 2)

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Checklist (CBCL) at baseline and at three and 12 month follow-ups. Teacher ratings were obtained by mailing the Teachers Report Form (TRF) to teachers immediately after the 12 month visit.

The findings reveal that younger children (mean age of 10 years) with mTBI had worse parent ratings on the CBCL total behavior problems scale ($p<0.001$) as compared to those with orthopedic injuries. Factors associated with higher parent or teaching ratings include hospitalization, motor vehicle accidents, loss of consciousness and magnetic resonance imaging abnormalities.

Conclusion: This study found that school-age children with mild traumatic brain injury are at risk for persistent symptoms of behavior problems, with is especially true among younger children

Taylor, H et al. Symptoms of Persistent Behavior Problems in Children with Mild Traumatic Brain Injury. **J Head Trauma Rehab**. 2015, October; 30(5) 302 – 310.

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